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BUY-
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R603722494 MAR63 10304040F713 E
CONGRESSIONAL INFO SVC
SRI ACQUISITIONS
4520 EAST-WEST HWY #800
WASHINGTON DC 20014

RAILWAY AGE

May 25, 1981

FEATURES



Cover article, page 32

26 The new breed of freight cars: A material difference

Just a few weeks after introduction of the filament-wound Glasshopper, Santa Fe and Alusuisse have unveiled the Algola—a lightweight gondola (40,700 pounds) with body shell and center sill made entirely of aluminum.

32 Buy—or lease? Reducing the guesswork

There's a time to buy, and there's a time to lease; within each alternative there are options, and options within options. This article offers guidelines designed to help both railroads and private investors reach a decision.

48 Marketing-minded CN Rail looks west

Operating efficiency is a major factor in CN's prosperity; skillful marketing is another. Marketers see the biggest opportunities for growth in the western provinces, but a shortage of expansion capital is a problem.

60 L&N: A new look for manual block

The board at Flomaton, Ala., generally resembles its CTC counterpart—but it's actually an ingeniously contrived "Manual Block Visual Display Board" that earned \$50,000 in employee-suggestion awards for its designers.



Page 26

NEWS

- 4 Short and Significant
- 9 RoadRailer: A different kind of test
- 11 NWS Enterprises: "A partnership"
- 14 Chessie: A new multi-mode concept
- 14 Conrail, Amtrak bills get moving
- 14 Rate of return: How 36 roads fared
- 19 End of the line for Auto-Train
- 19 Canadian firm plans auto service
- 81 The impact of dereg on managers
- 87 The Railroad Market

COMMENTS

- | | | | |
|----|---------------------|----|----------------|
| 3 | Inside | 19 | Lines on Labor |
| 11 | Watching Washington | | |

DEPARTMENTS

- | | | | |
|----|--------------------|----|------------------------|
| 68 | People in the News | 89 | Classified Advertising |
| 72 | Suppliers | 90 | Professional Cards |
| 86 | 100 Years Ago | 91 | Guide to Advertisers |
| 87 | Carloadings | 92 | Product Report |
| 88 | Bookshelf | 92 | New Literature |



Page 48

COVER: Photo by Roy H. Blanchard

Chessie: A new multi-mode plan

A through-service intermodal package involving movement by ocean, river, rail, and highway has been put together by Chessie and Dravo Mechling, the Dravo Corp.'s water-transport subsidiary.

The first shipment handled under the new plan consisted of 1,400 tons of steel. It moved by ocean vessel to New Orleans, by barge to a dock near Cincinnati, by rail (in 24 gondolas) to Plymouth, Mich., and by truck to the consignee.

"The combination of carriers is something we probably would not have considered a few years back," said Kenneth E. Mills, an assistant vice president in charge of the metals and minerals business group in Chessie's commercial department. "Now, after several years of planning, we have a solid intermodal concept where we can save shippers money."

"Before our multi-mode concept was worked out, the customer had to arrange the barge transfer and trucking service. Under this new set-up, Dravo Mechling and Chessie do all of this." A single rate is quoted for movement from New Orleans to the ultimate destination.

Conrail, Amtrak bills get moving

The Congressional tug-of-war over Conrail and Amtrak continues to be one of the more newsworthy contests set off by the Reagan Administration's cost-cutting blitz. The battle will extend well into the summer. While no clear-cut victory is indicated for either side, the cost-cutters seem likely to win more points than they will lose.

In the Republican-dominated Senate, the administration's Conrail bill has moved out of committee and awaits a floor vote. The administration, whose goal is to sell Conrail off to other railroads has an answer for those who claim that this will result in cherry-picking. The bill requires that Conrail lines be offered to prospective buyers in packages that would combine highly profitable routes with less attractive lines. Under the plan, any such transfer package would be subject to 160 days of public comment, Justice Department and ICC review, and final approval by the DOT secretary. Then Congress would have 120 days to act before the transfer would take place.

To make Conrail attractive on the market, the legislation would free the railroad of its Title V labor protection obligations, commuter train operations, unfavorable rate divisions, and some work rule provisions.

In the House, which is controlled by

the Democrats, a bill sponsored by Rep. James J. Florio (D.-N.J.), contains many of the same provisions that are in the Senate bill—with the main difference that it would not provide for the automatic sell-off of Conrail. The House bill would give Conrail a chance to stay in business, although sell-off could occur if at stated mileposts the expected degree of turnaround had not taken place.

In an effort to forestall a Conrail "fire sale," railroad labor leaders agreed—subject to rank-and-file approval—to the deferral of about \$229 million in annual wage increases over the next five years. While many more concessions would still have to be made by labor, including work rule reforms and reduction of Title V benefits, this action was viewed as a signal of labor's willingness to compromise.

As for Amtrak, one thing is already clear: It will not receive the \$853 million FY1982 authorization it most recently requested. The Department of Transportation is sticking by its request for a budget of \$613 million, and that figure held firm in legislation approved by a Senate committee on April 29. In its own bill, the

corresponding House committee was, as expected, more generous, but the \$725 million it approved on May 14 was far short of the Amtrak request. The \$725 million, said Congressman Florio, "would provide a scaled down, leaner national system."

Under the administration-backed Amtrak bill, the railroad would be required to cover at least 50% of its operating costs in FY 1982—something Amtrak has already said it would do. The bill would also require that any state-supported 403(b) trains be funded by states for at least 20% of the avoidable loss in the first year, 35% in the second year, and 50% thereafter. Commuter service operated under contract in the corridor could be provided only if states or local governments pay all the costs.

The Florio bill, which is designed to minimize the route cutbacks Amtrak would have to make to live within a lower budget, would require the elimination of some sleeping and dining car services and the recovery of all costs of food and beverage service, now estimated to lose about \$50 million in FY 1982.

1980 return: How 36 railroads fared

Class I railroads as a group earned a 4.25% return on investment in 1980, best showing in a quarter of a century. This was, of course, an average; some railroads did a lot better, some a lot worse. Below are the rates of return for individual carriers as reported by the ICC.

Railroad	Net Railway Operating Income (000 omitted)	Return on Net Investment (Percent)
Baltimore & Ohio	\$51,186	3.85
Bessemer & Lake Erie	17,883	12.01
Boston & Maine	3,868	3.03
Chesapeake & Ohio	71,354	6.96
Conrail	(348,656)	-0-
Delaware & Hudson	(5,440)	-0-
Detroit, Toledo & Ironton	(4,022)	-0-
Elgin, Joliet & Eastern	4,493	4.12
Grand Trunk Western	(7)	-0-
Long Island	(9,962)	-0-
Norfolk & Western	199,080	9.64
Pittsburgh & Lake Erie	18,711	11.01
Western Maryland	6,653	4.69
Clinchfield	26,371	21.24
Florida East Coast	8,270	6.32
Illinois Central Gulf	(5,588)	-0-
Louisville & Nashville	71,688	5.76
Seaboard Coast Line	102,239	7.39
Southern	214,312	9.71
Atchafalaya, Topeka & Santa Fe	177,435	7.64
Burlington Northern	172,831	5.63
St. Louis-San Francisco	37,606	6.57
Chicago & North Western	17,348	2.37
Milwaukee Road	(100,885)	-0-
Colorado & Southern	6,841	8.26
Denver & Rio Grande Western	33,023	9.86
Duluth, Missabe & Iron Range	8,234	7.08
Fort Worth & Denver	11,998	20.78
Kansas City Southern	25,583	8.94
Missouri-Kansas-Texas	10,601	6.54
Missouri Pacific	183,987	4.12
St. Louis Southwestern	31,539	6.86
Soo Line	35,123	10.02
Southern Pacific Transportation Co.	65,967	2.88
Union Pacific	214,351	8.58
Western Pacific	2,870	3.21

BUY- OR LEASE?

Reducing the guesswork

There are many ways to acquire a freight car—and for the unwary the decision-making path is full of unexpected twists.

Railway Age asked two experts for some broad guidelines. This is their report.

By WALTER H. POGUE, JR.
and JOHN H. RUBEL

Railroad and shipping industry managers frequently face the issue of how best to finance freight cars after a decision to acquire has been made. Purchasing and leasing are broad categories of acquisition methods. Within those categories are variations that involve different costs and different returns.

Purchasing is an acquisition vehicle whereby ownership and use of the acquired cars reside in the same party. That party either takes title or has a call on the title at a fixed price. The owner/user depreciates the equipment. Leasing is an acquisition vehicle whereby ownership and use of acquired cars reside in different parties. The acquirer (lessee) neither takes title nor has a call on the title at a fixed price. The acquirer does not depreciate the equipment.

The selection process with its operating and financial considerations leads to an economic decision. It is incumbent upon decision makers to select the method of financing that maximizes the present value of net after-tax profit over the life of the equipment. The selection involves objectivity, subjectivity and risk assessment. Objectivity is the easy part. Subjectivity and risk assessment, at best, lead to educated guesses. An experienced analyst knows what *can* happen. Some know what *will* happen, but not *when*. Timing may not be everything but it is very important. Future events can affect the profitability of a transaction.

The decision making process is complicated today because there are more financing options available. Giant corporations, financial institutions, and doctors all want to be "your money supplier."

The acquirers fall into three broad classes: railroads, shippers, and operating leasing companies. All use cars as instruments with which to make money. However, each "uses" cars in different ways.

Trunk line railroads acquire cars primarily to profit from hauling freight. An

ancillary purpose may be to correct negative imbalances in car hire payments. Some railroads have discovered that profits can be earned from owning a car fleet and keeping it off line. They have discovered additionally that the risk of relying on such profits is high.

Shippers acquire cars primarily to transport their own commodities. Normally such cars operate under private reporting marks and special operating rules. Railroads control the introduction of such cars by controlling the issuance of reporting marks and registration in the Universal Machine Language Equipment Register (UMLER). Railroads permit private cars to be introduced when they are unable or unwilling to furnish cars for a specific service. Shippers incorporate cars into their distribution systems. Economic returns are generated through greater market penetration and handling and storage savings.

Most privately marked car types are refrigerators, tanks, and covered hoppers.

In its earliest days, the refrigerator car was considered too special for railroads, and therefore private ownership was permitted. Subsequently, railroad owned private car lines were formed as entities to own and operate refrigerator car fleets.

The next specialized car to be developed was the tank car. Railroads never have seen fit to furnish tank cars, either directly or through railroad owned private car lines. Thus the great tank car leasing companies have flourished.

Finally, the covered hopper car was developed, initially for cement. Grain was still handled in box cars for a time until economics forced it into large covered hoppers. Today the covered hopper car fleet is divided between railroads and private owners, each acquiring cars as economics dictate. There is an ongoing debate as to whether railroads should supply the base requirement and shippers supply the peak demand or vice versa. There are, however, several specialized types of covered hoppers that railroads are leaving to the private owners. These are cars designed for

plastic pellets and finely divided materials that require pneumatic assistance for unloading and contamination free containment.

There is a trend toward private ownership of other car types such as unit train coal and aggregate cars operating under contract rates and all-door box cars for handling building materials. Unit train coal car fleets are most likely to increase in number and assume an importance on a level with tank and covered hopper cars.

Operating leasing companies generate returns by profiting from the spread between financial ownership costs and rental rates. Prior to the 1960's, car types were confined mostly to tank and refrigerator. Now most car types are represented on the rosters of operating leasing companies and bear reporting marks of both private car lines and railroads. Operating leasing companies fall into two categories: railroad and non-railroad owned. Railroad owned leasing companies were founded primarily to furnish cars to their owners while gaining benefits from pooling and specialized car management. Rental rates are designed to provide a trade-off between low costs and profits sufficient to maintain a strong balance sheet in order to command attractive financing rates. Non-railroad owned operating leasing companies are in business to make a profit by taking risks and providing services that users do not wish to take or provide.

Each acquirer makes a selection of financing from the many options under the purchasing and leasing arrangements that are available.

● **The purchase option.** An acquirer selecting purchase can do so by paying cash or borrowing funds, or by some combination of both. Under a purchase arrangement the acquirer assumes all ownership responsibilities—financial obligations, maintenance, repair, property taxes, insurance and administration. The purchaser has title or call on title at a fixed price, can depreciate the equipment, and receives all tax benefits.

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✓ A cash purchase is unusual because sufficient cash seldom is available for large capital projects. Railroads, shippers and operating leasing companies might use cash under a certain combination of circumstances—e.g. cash is available from the sale of other assets; no other use for available cash at a higher return exists; or future borrowing costs would be lowered by increasing the fixed asset base without increasing debt.

✓ A conditional or an installment sale is an arrangement under which a lending institution provides up to 100% of the pur-

chase price. The acquirer takes title or has a call on title at a fixed price. A lease with an option to purchase at a fixed price is such a transaction. It is also called an "untrue" or "equity" lease. Payments are made over a fixed term and the loan is secured by the equipment. Cost of borrowing is predicated on credit standing of the acquirer. Lenders can be banks, insurance companies, pension funds or individual investors purchasing equipment trust certificates.

Railroads, shippers and operating leasing companies use this alternative if cash

is not available or if cash can be put to work earning a higher return elsewhere. Additionally, the acquirer should be sufficiently profitable that tax benefits can be used to increase the return on investment.

● **The leasing alternative.** Leasing involves a greater degree of complexity than purchasing. Ownership and use reside in different parties, and assignment of ownership costs other than those associated with financing must be contractually defined with precision.

Leases are classified by length of term. A full payout lease, sometimes referred to as a capital lease, is one under which the sum of payments required by the lessee is sufficient to return the lessor's total investment in the equipment plus a profit. Conversely an operating lease is one under which the sum of payments required of the lessee is insufficient to return lessor's investment in the equipment.

Leases are classified also by which parties assume which ownership costs (other than financing). A net or triple net lease is one under which the lessee is responsible for rental payments to the lessor and for all other ownership costs, which include maintenance, repair, property taxes, insurance, administration, and movement and storage charges if incurred. A full service lease is one under which the lessor assumes responsibility for the financial and non-financial ownership costs. A third alternative is the modified net or modified service lease, under which the various non-financial ownership costs are assigned to the two parties on a negotiated basis for commercial and operating reasons.

The latter alternative was developed primarily in connection with short term leases of existing cars after leases to original lessees had expired. For example, the lessor might retain responsibility for basic structure integrity and the lessee assume responsibility for running repairs and damage. In other cases, lessors might assume responsibility for property taxes and insurance only. Any arrangement can be designed to fit the circumstances and interests of the parties engaged in a transaction.

For purposes of describing the various financial arrangements the basic kinds of

"The choices can be narrowed considerably by determining first if need for equipment is short term or long term..."

leases can be summarized in the form of a matrix.

	Full Payout	Operating
Net	A	B
Full Service	C	D

● **Full payout net lease.** A full payout net lease is a long term lease under which the lessee has use of the equipment for most of its useful life (not exceeding 80%) and assumes the non-financial ownership costs while under lease. This lease takes one of two forms. One is a leveraged lease under which the lessor borrows a significant portion of the acquisition cost without using his (lessor's) credit to obtain the borrowing. The borrowing is termed "non-recourse" (to lessor) and is obtained through a pledge by the lessor to the lender of the lessee's promise to pay rent, and by grant of a first lien on the equipment to the lender.

The other is a single investor lease under which the lessor uses his own funds to acquire the equipment. If a single investor lessor borrows funds to make an equipment acquisition, he does so through use of his own credit, not that of the lessee.

Railroads, shippers and operating leasing companies use full payout net leases. They do so as an alternative to ownership when it can be justified on an economic basis. The lessee makes the judgment that low cost per month or per quarter, and no money down, more than justify the loss of tax benefits and "residual" value at end of term.

Bank leasing companies and commercial finance companies are lessors. They perceive such investments as alternatives to long term loans. This type of investment is like a loan in that money is returned over time. It is unlike a loan in that not all of the profit is obtained from the excess of the borrower's repayment over the lender's investment. Some of the return comes through tax benefits associated with equipment ownership, e.g. investment tax credit and depreciation. Lessors look at full payout net leases as higher risk investments than loans (because of uncertainties associated

with residual values and future tax benefits); but that higher risk is seldom reflected in more than a few percentage points of interest. Lessors of this type usually are passive in nature (that is, not active in the business of the lessee, just as a lender is not active in a borrower's business).

● **Net operating lease.** A net operating lease is a short term lease under which the lessee assumes non-financial ownership costs. Such leases are rare because lessors are reluctant to relinquish control of maintenance for cars that might be returned before the debt is repaid.

Railroads and shippers that have car management capabilities are most likely to choose this option if they perceive no long term need for the equipment.

Operating leasing companies, commercial finance companies, and sometimes manufacturers are lessors. These lessors offer net operating leases only if they feel confident that they will be able to find other users for the equipment after the original lease.

The term "net operating" lease has come into use in recent years. At one time an "operating" lease was synonymous with "full service" lease. The only leases then in use were net full payout and full service leases. Typically, railroads selected net payout leases and shippers leased cars from major private car lines on a full service basis.

● **Full service full payout.** This designation describes a long term lease whereby all acquisition costs, all non-financial ownership costs, and a profit are returned to the lessor during the lease. Usually the non-financial ownership costs are covered by either an escalation provision or cost plus arrangement. The relatively new "per diem" lease can fall in this classification.

Short line railroads and shippers are most likely to select full service full payout leases. They do so if they are unable or unwilling to manage their own equipment but wish to retain the equipment for most of its useful life.

Operating leasing companies normally are lessors. Should payout lease be with a good credit company as lessee and future remarketing requirement not likely, a passive leasing company could be lessor while contracting for service from one of the car management companies that now exist.

● **Full service operating lease.** Along with the net full payout lease, the full service operating lease is most widely used. The lessee has use of the equipment for a relatively short portion of its useful life.

Maintenance management and all ownership costs are responsibilities of lessor.

Shippers and short line railroads are the most likely lessees.

Operating leasing companies normally are the lessors. They are capable of managing and remarketing the equipment when returned. Historically, returns to operating leasing companies have been high because of the high risks associated with non-payout leasing.

The road to a lease transaction can take many twists and turns. The arrangements described above are not all inclusive. Special circumstances sometimes result in unique arrangements. One certainly is that lending institutions must be protected in some manner. Sound financial health of the acquirer is preferred. Credit support from car builders, third party railroads, and shippers has been used. (The recent losses suffered by some lending institutions were the result of miscalculations, not the desire to assume inordinate risks.)

● **The decision process.** The options available within the leasing alternative are more numerous than those within the purchasing alternative. However, the choices can be narrowed considerably by determining first if need for equipment is short term or long term. The short term need generally eliminates the purchasing alternative. The long term need generally eliminates the short term full service leasing option.

The next consideration is ability of the acquirer to manage cars. Obviously, railroads have it. Shippers operating large car fleets can afford it.

Another consideration is balance sheet treatment of an equipment acquisition. Railcar acquisitions, other than those using cash, involve some form of financial liability. In exchange for ownership or use of an asset, a promise to make payments over a specified time period is made. The contractual obligation is a liability that takes its place along with other liabilities of the business enterprise.

Normally, short term leasing obligations are not treated as balance sheet liabilities. However, operating leases can involve substantial sums of money, and financial footnotes will call the attention of interested parties to those obligations.

Purchases and capital leases require balance sheet treatment. Both affect future borrowing and leasing capacities and their costs. An acquirer may wish to obtain expert legal and financial advice in determining the economic impact of each alternative form of financing as part of the analysis.

Once the needed term, car management, and balance-sheet questions are answered it is most probable that tax considerations will direct the acquirer to

a selection of one of the options available.

● **A checklist.** When a railroad, a shipper, or an operating leasing company embarks on the evaluation process, many questions should be answered. Obviously, answers to some questions will differ with category of acquirer. Some of the

questions pertaining to the acquiring company are:

- Is the need for equipment long or short term?
- What is the equipment likely to be worth when need for it no longer exists?

- Will equipment become obsolete within its useful life?
- Is there in-house car management capability?
- Is cash available for purchase?
- Are purchase funds available from borrowing sources?

Buy or Lease — A case study

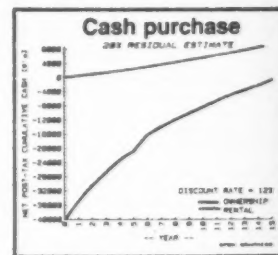
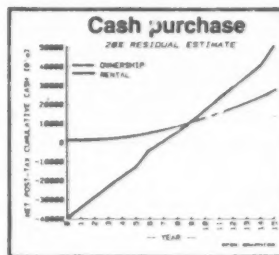
These tables and charts show three buy or lease comparisons for a freight car costing \$40,000 with an economic life of 15 years. The variable for the different cases are the amounts of contributed and borrowed capital, and residual values estimated at 20% and at 50%. The residual values in these cases represent the user's estimate of the scrap or resale market value of the freight car after 15 years.

The decision to buy or lease is based on net present value analysis for each of the test case comparisons. On the theory that a dollar in hand today is worth more than the promise of a dollar at some future time, net present value analysis examines the present value of all outlays and inflows of funds over the economic term of the transaction. Buy or lease decisions are made on the

sets of assumptions producing the highest net present value after 15 years. The following basic assumptions apply to all of the purchase cases:

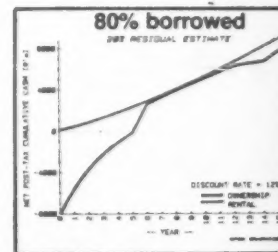
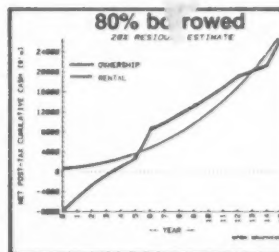
- The freight car will generate an economic benefit (revenue or saving) to the user of \$425 per month, and this benefit will grow by 6% per year.
- If the car is purchased with borrowed funds, they will be repaid over 15 years at 14% interest.
- If the car is purchased, it is depreciated over 12 years on the double declining method, switching to straight line in 7th year.
- The user pays income taxes at a 46% marginal rate, and does not use the investment tax credit arising from purchase until the sixth year.

Year	Revenue or Savings	Net Income	Depreciation	Taxable Net Income	Income Tax @46%	Profit After Tax	Cumulative P.A.T.	Net Present Value
0	-40,000	-40,000	0	-40,000	0	0	0	-34,803
1	5,100	5,100	6,667	-1,567	-721	5,821	-34,179	-30,438
2	5,406	5,406	5,556	-150	-69	5,475	-28,705	-26,720
3	5,730	5,730	4,630	1,101	506	5,224	-23,481	-20,696
4	6,074	6,074	3,858	2,216	1,019	5,055	-18,426	-16,178
5	6,439	6,439	3,215	3,224	1,483	4,956	-13,470	-11,859
6	6,825	6,825	2,679	4,146	1,903	4,922	-8,548	-9,905
7	7,234	7,234	2,233	5,002	2,301	4,934	-3,614	-8,077
8	7,669	7,669	1,858	5,811	2,672	5,000	1,386	-6,364
9	8,129	8,129	1,544	6,585	3,029	5,096	6,482	-4,758
10	8,616	8,616	1,287	7,329	3,374	5,242	11,724	-3,298
11	9,133	9,133	1,073	8,060	3,708	5,425	17,149	-1,965
12	9,681	9,681	894	8,787	4,031	5,650	22,800	-785
13	10,262	10,262	740	9,522	4,342	5,920	28,720	0
14	10,878	10,878	600	10,278	4,728	6,150	34,870	1,768
15	19,531	19,531	0	19,531	8,984	10,547	50,822	8,551



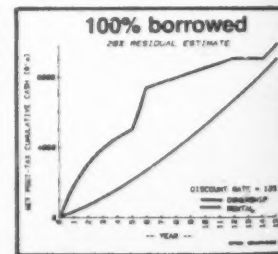
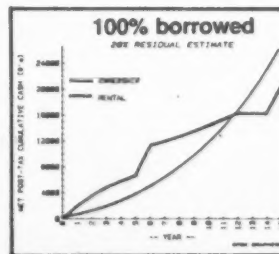
Case 1a. ● 100% cash purchase
● 20% residual value
Net present value:
Buy: -\$359 Lease: \$8,811
Decision is to LEASE

Year	Revenue or Savings	Net Income	Depreciation	Taxable Net Income	Interest	Income Tax @46%	Profit After Tax	Cumulative P.A.T.	Net Present Value
0	-8,000	-8,000	0	-8,000	0	0	0	0	-5,546
1	5,100	5,114	1,114	4,000	4,338	-2,782	2,748	-5,252	-3,668
2	5,406	5,114	992	4,122	4,338	-2,064	2,356	-2,896	-2,208
3	5,730	5,114	816	4,300	4,221	-1,435	2,052	-844	-1,051
4	6,074	5,114	660	4,454	4,067	-861	1,621	977	-114
5	6,439	5,114	522	4,617	3,934	-710	1,651	2,628	2,690
6	6,825	5,114	400	4,795	3,758	-382	1,653	4,281	3,348
7	7,234	5,114	292	4,942	3,555	-1,447	1,665	5,946	3,987
8	7,669	5,114	200	5,069	3,322	-1,113	1,756	7,702	4,603
9	8,129	5,114	122	5,177	3,055	-841	1,907	9,609	5,192
10	8,616	5,114	62	5,254	2,747	-636	2,073	11,682	5,751
11	9,133	5,114	22	5,282	2,394	-457	2,073	13,755	6,279
12	9,681	5,114	0	5,282	1,988	-461	2,055	15,810	6,785
13	10,262	5,114	0	5,148	1,521	-871	4,021	17,831	7,269
14	10,878	5,114	0	5,764	984	-984	4,551	19,382	7,709
15	19,531	5,114	0	14,417	368	19,163	8,185	26,660	8,185



Case 2a. ● Purchase with 20% cash and 80% borrowed funds
● 20% residual value
Net present value:
Buy: \$7,809 Lease: \$8,811
Decision is to LEASE

Year	Revenue or Savings	Net Income	Depreciation	Taxable Net Income	Interest	Income Tax @46%	Profit After Tax	Cumulative P.A.T.	Net Present Value
0	0	0	0	0	0	0	0	0	1,768
1	5,100	6,392	-1,292	6,667	5,547	-3,272	1,980	1,980	3,024
2	5,406	6,392	-986	5,556	5,421	-2,562	1,578	3,558	3,920
3	5,730	6,392	-662	4,630	5,276	-1,961	1,259	4,815	4,564
4	6,074	6,392	-318	3,858	5,109	-2,893	1,013	5,827	5,032
5	6,439	6,392	-46	3,215	4,917	-1,694	825	6,653	5,406
6	6,825	6,392	433	2,679	4,697	-551	4,686	11,339	5,706
7	7,234	6,392	842	2,233	4,444	-558	585	11,924	5,938
8	7,669	6,392	1,276	2,233	4,153	-283	590	12,510	6,093
9	8,129	6,392	1,736	2,233	3,819	-2,077	956	13,466	6,230
10	8,616	6,392	2,224	2,233	3,434	-2,949	1,357	14,823	6,350
11	9,133	6,392	2,741	2,233	2,992	-3,908	1,798	16,621	6,450
12	9,681	6,392	3,289	2,233	2,485	-4,964	2,283	18,304	6,538
13	10,262	6,392	3,870	0	1,901	0	3,846	22,150	6,613
14	10,878	6,392	4,486	0	1,230	0	4,438	26,588	6,673
15	19,531	6,392	13,138	0	459	0	8,773	35,361	6,713



Case 3a. ● 100% borrowed funds
● 20% residual value
Net present value:
Buy: \$9,851 Lease: \$8,811
Decision is to BUY

- Can the balance sheet tolerate the amount of debt assumption required to finance the equipment?
- Are there more productive uses for cash and/or funds available from borrowing lines?
- Are tax benefits associated with

equipment ownership useful?
The answer to these questions may sometimes be absolute. The overall answer, however, is seldom absolute until the following additional question is asked:
—Does another party perceive the

risks and returns of ownership in a different manner, with the result that the acquirer can enjoy a lower cost of using the equipment if ownership were to reside in that party?
This is known as the "arbitrage" question. (Arbitrage is defined by Webster as

Lease Basis

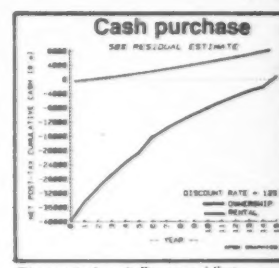
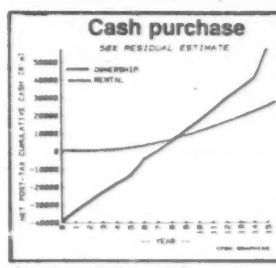
The table to the right shows the flow of funds when the freight car is leased on a 15 year net lease at \$385 p.c.r month. All of the purchasing cases shown below are compared to this case and the buy or lease decision is measured against this net present value of \$8,811 after 15 years.

Year	Revenue or Saving	Lease Cost	Taxable Net Income	Income Tax @ 46%	Profit After Tax	Cumulative P.A.T.	Net Present Value
0	-40,000						
1	5,100	4,620	480	221	259	259	231
2	5,406	4,620	786	362	424	684	570
3	5,730	4,620	1,110	511	600	1,283	997
4	6,074	4,620	1,454	669	785	2,068	1,496
5	6,439	4,620	1,819	837	982	3,051	2,053
6	6,825	4,620	2,205	1,014	1,191	4,241	2,656
7	7,234	4,620	2,614	1,203	1,412	5,653	3,295
8	7,669	4,620	3,049	1,402	1,646	7,299	3,960
9	8,129	4,620	3,509	1,614	1,895	9,194	4,643
10	8,616	4,620	3,996	1,838	2,158	11,352	5,338
11	9,133	4,620	4,513	2,076	2,437	13,789	6,038
12	9,681	4,620	5,061	2,328	2,733	16,522	6,740
13	10,262	4,620	5,642	2,595	3,047	19,569	7,438
14	10,878	4,620	6,258	2,879	3,379	22,948	8,130
15	11,531	4,620	6,911	3,179	3,732	26,680	8,811

Summary

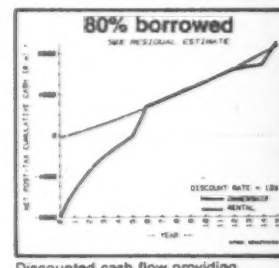
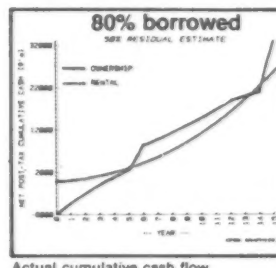
Capital source	User expects	
	20% Residual value	50% Residual value
1. 100% cash	Lease	Lease
2. 80% borrowed	Lease	Buy
3. 100% borrowed	Buy	Buy

Year	Revenue or Saving	Net Income	Depreciation	Taxable Net Income	Income Tax @ 46%	Profit After Tax	Cumulative P.A.T.	Net Present Value
0	-40,000	-40,000	0	-40,000	0	0		
1	5,100	5,100	6,667	-1,567	-721	5,821	-34,179	-34,803
2	5,406	5,406	5,556	-150	-69	5,475	-28,705	-30,439
3	5,730	5,730	4,630	1,101	506	5,224	-23,481	-26,720
4	6,074	6,074	3,858	2,216	1,019	5,055	-18,426	-23,508
5	6,439	6,439	3,215	3,224	1,483	4,956	-13,470	-20,696
6	6,825	6,825	2,679	4,146	2,093	4,732	-8,738	-18,178
7	7,234	7,234	2,233	5,002	2,301	4,934	-3,802	-15,946
8	7,669	7,669	2,233	5,436	2,500	5,168	5,550	-11,859
9	8,129	8,129	2,233	5,896	2,712	5,416	10,966	-9,905
10	8,616	8,616	2,233	6,384	2,936	5,680	16,646	-8,077
11	9,133	9,133	2,233	6,901	3,174	5,959	22,605	-6,364
12	9,681	9,681	2,233	7,449	3,426	6,255	28,860	-4,758
13	10,262	10,262	0	10,262	4,721	5,542	34,401	-3,488
14	10,878	10,878	0	10,878	5,004	5,874	40,275	-2,286
15	11,531	11,531	0	11,531	5,304	6,227	46,502	828



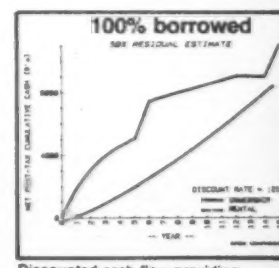
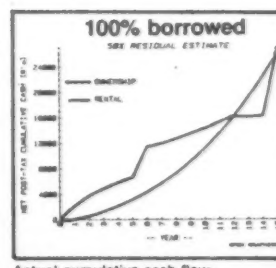
Case 1b. • 100% cash purchase
• 50% residual value
Net present value:
Buy: \$825 Lease: \$8,811
Decision is to LEASE

Year	Revenue or Savings	Payment	Net Income	Depreciation	Taxable Net Income	Interest Income	Income Tax @ 46%	Profit After Tax	Cumulative P.A.T.	Net Present Value
0	-8,000	0	-8,000	0	0	0	0	0	0	
1	5,100	5,114	-14	6,667	4,438	-6,004	-2,762	2,748	-5,252	-5,546
2	5,406	5,114	292	5,556	4,337	-4,486	-2,064	2,356	-2,896	-3,660
3	5,730	5,114	616	4,630	4,221	-3,120	-1,435	2,052	-844	-2,208
4	6,074	5,114	960	3,858	4,087	-1,871	-861	1,821	-977	-1,081
5	6,439	5,114	1,325	3,215	3,934	-710	-327	1,651	-2,626	-114
6	6,825	5,114	1,711	2,679	3,758	-388	-382	1,533	-1,161	2,609
7	7,234	5,114	2,121	2,233	3,555	-1,447	-665	1,455	9,616	3,348
8	7,669	5,114	2,555	2,233	3,322	-2,113	-972	1,582	11,198	3,987
9	8,129	5,114	3,015	2,233	3,055	-2,841	-1,307	1,708	12,906	4,603
10	8,616	5,114	3,502	2,233	2,747	-3,636	-1,673	1,830	14,736	5,192
11	9,133	5,114	4,019	2,233	2,394	-4,507	-2,073	1,946	16,682	5,751
12	9,681	5,114	4,567	2,233	1,988	-5,461	-2,512	2,055	18,738	6,279
13	10,262	5,114	5,148	0	1,521	-8,741	-4,021	1,127	19,865	6,537
14	10,878	5,114	5,764	0	984	-9,894	-4,551	1,213	21,078	6,785
15	11,531	5,114	6,417	0	368	-11,183	-5,143	1,202	22,280	6,993



Case 2b. • Purchase with 20% cash and 80% borrowed funds
• 50% residual value
Net present value:
Buy: \$8,993 Lease: \$8,811
Decision is to BUY

Year	Revenue or Savings	Payment	Net Income	Depreciation	Taxable Net Income	Interest Income	Income Tax @ 46%	Profit After Tax	Cumulative P.A.T.	Net Present Value
0	0	0	0	0	0	0	0	0	0	
1	5,100	6,392	-1,292	6,667	5,547	-7,114	-3,272	1,980	1,980	1,788
2	5,406	6,392	-986	5,556	5,421	-5,570	-2,562	1,576	3,556	3,024
3	5,730	6,392	-662	4,630	5,276	-4,175	-1,921	1,259	4,815	3,920
4	6,074	6,392	-318	3,858	5,109	-2,893	-1,331	1,013	5,828	4,584
5	6,439	6,392	46	3,215	4,917	-1,694	-779	825	6,653	5,032
6	6,825	6,392	433	2,679	4,697	-551	-4,254	6,686	11,339	7,406
7	7,234	6,392	842	2,233	4,444	-558	-257	585	11,924	7,871
8	7,669	6,392	1,276	2,233	4,153	-1,283	-590	686	12,610	7,948
9	8,129	6,392	1,736	2,233	3,819	-2,077	-956	781	13,391	8,230
10	8,616	6,392	2,224	2,233	3,434	-2,949	-1,357	867	14,258	8,509
11	9,133	6,392	2,741	2,233	2,992	-3,908	-1,798	943	15,201	8,790
12	9,681	6,392	3,289	2,233	2,485	-4,964	-2,283	1,006	16,207	9,038
13	10,262	6,392	3,870	0	1,901	-8,361	-3,846	24	16,231	9,043
14	10,878	6,392	4,486	0	1,230	-9,648	-4,438	48	16,279	9,053
15	11,531	6,392	5,139	0	459	-11,071	-5,093	10,846	27,124	11,035



Case 3b. • 100% borrowed funds
• 50% residual value
Net present value:
Buy: \$11,035 Lease: \$8,811
Decision is to BUY

"Before leveraged leasing appeared, concern with market values lay primarily with those of cars ready for retirement..."

"simultaneous purchase and sale of the same or equivalent security in order to profit from price discrepancies.") The answer sometimes is clear, sometimes cloudy. An acquirer currently not paying federal income taxes might conclude that another party that is paying those taxes would consider the risks and returns of ownership in a manner that would reduce the cost of using the equipment. Again "reducing the cost" means that relatively more after-tax, present value dollars are retained if an alternate means of financing is employed.

An acquirer can answer the arbitrage question by comparing the after-tax return expected from ownership with after-tax returns expected by various types of lessors.

The case study (pp. 38-39) describes graphically several lease versus purchase arbitrage analyses.

As an example of the lessor's side of an arbitrage, the following are expected after-tax returns on investment as perceived by the lessor:

	Full Payout	Operating
Net	8% to 15%	10% to 15%
Full Service	12% to 30%	12% to 30%

These returns may or may not be sufficient for an acquirer, but an equipment user contemplating the arbitrage question as it relates to alternative sources of financial resources should consider the lessors' expected return on investment. If the acquirer has projects returning more than lessors' expected returns, after-tax net might be improved by leasing cars and applying available funds to those projects.

Conversely, lessors' expectations of residual values may work against leasing and in favor of purchasing. Matrix below shows lessors' expected residual values in freight cars after 15 years.

	Full Payout	Operating
Net	15% to 25%	25% to 55%
Full Service	25% to 55%	25% to 55%

These percentages are residual values after 15 years as a percentage of original acquisition costs.

An acquirer when contemplating the arbitrage question as it relates to future residual or market value may find that his expectations are higher than those of lessors and may decide to purchase rather than lease.

● **Market values in retrospect.** Before leveraged leasing appeared, concern with market values lay primarily with those of cars ready for retirement. Residual values were those amounts offered by scrap dealers or industrial users acquiring non-interchange cars for plant use.

With the advent of leveraged leasing, the residual value of an asset became an ingredient in the calculation establishing rate of return to a lessor. The owner's expected rate of return can be adjusted by changing the assumed residual value. In turn, the owner's desired rate of return along with the senior lender's required interest rate establishes the level of lease payments. Therefore, assumed residual value is one of several factors that determine the cost of choosing the leveraged leasing alternative.

In a "true lease," the lessee has no equity. The lessee normally is given an option to purchase equipment at the end of the initial term for an amount equal to "fair market value." At that time "fair market" and "residual" values are synonymous.

Since leveraged leasing began during the early 1960's and initial terms typically were for 15 years, expirations have been experienced since the late 1970's. Problems associated with lease expirations and establishment of "fair market values" have surfaced recently.

Most early leveraged leasing deals were between railroads and passive lessors having no intention or interest in participating in operating businesses. Many lease expirations were followed by renewals at nominal lease rates that were mutually agreed upon by the parties. Therefore the process of soliciting bids on which to establish fair market values was not normally practiced. The problems described below did not surface until lessors began to desire conversion of rolling stock assets into cash. This is a recent development, perhaps brought on by perceptions that higher returns are available in other investments.

One problem is establishment of lessees' contractual obligations to restore cars to conditions based on whatever standards were prescribed when leases were originated. Maintenance standards designed to qualify cars for interchange service are precise. However, leases generally require that cars be re-

turned in original condition plus any modifications or additions required by regulatory agencies less "ordinary wear and tear." What constitutes "ordinary wear and tear" is many times debatable. Accurate definition would require establishment of measurable wear and corrosion limits for each component subject to such forms of deterioration. Language in typical lease contracts leaves the subject mentioned only in the most general terms. Present practice is to negotiate settlement between the parties based on joint inspections and business considerations.

A problem for lessees is that maintenance monies spent during lease terms tend to enhance fair market values, especially if cars are reconditioned during the later years of the terms. Prospective purchasers and lessees offer bids based on economic values to them of cars fit for their services. Bids are discounted by amounts necessary to meet their requirements. Therefore, lessees have incentives to do as little as possible to cars until after they have purchased them or renewed the leases. Otherwise they are spending monies twice, once in maintenance and again in incremental acquisition prices.

A problem for lessors that tends to work in favor of lessees is the normal provision that the lessee has "right of first refusal" to meet the highest bid from prospective acquirers. This tends to diminish fair market value in that it discourages bidding. Prospective acquirers are reluctant to spend time, money, and effort to inspect cars, prepare bids, and arrange financing if they feel that it is likely that lessees will keep the equipment.

Market values are influenced by regulatory requirements pertaining to cars that change ownership after age 20. Prior to age 21, cars may change ownership with no additions or modifications other than those required to correct defects as prescribed by the AAR Interchange Rules. From age 21 until the maximum age of 40 is reached, cars changing ownership and going into interchange service must meet the requirements of AAR Mechanical Rule 33. Three costly requirements can be stabilized trucks, welded train lines, and addition of slack adjusters. Another provision is that, after cars reach the age of 26, they may not be rebuilt and receive a zero built date for AAR car hire purposes. Because of these requirements, market values tend to drop precipitously at ages 21 and 26, respectively.

Lessors sometimes find that they can enhance fair market values of cars they desire to remarket by providing more attractive financing than available to cash buyers having to obtain financing from other sources.

● **Lessons from recent history.** Although the future is seldom like the past, a look at the experience of those recently

"It is now evident that 50-foot boxcar and grain covered hopper car fleets have been overbuilt..."

dealing in residual value situations might be useful. The first observation is that there are few predictable patterns in market values of secondhand cars. Wide fluctuations have been occurring by car type and market demand at various times.

In less than one year market prices for small-cube covered-hopper cars between 20 and 25 years of age rose from slightly above scrap value to approximately three times scrap value. Following refurbishing, the same covered hopper cars were selling for export to Mexico at approximately two and one-half times original cost.

At times during the past five years, boxcars, hopper cars, and covered hopper cars have commanded market prices well in excess of original cost. At other times it was difficult to find buyers at all.

The acquirer that purchased rather than leased is seldom concerned with fair market values after initial financial obligations are satisfied. Such a company is not faced with the problems associated with lease terminations. Neither is it faced with the prospect of having to make replacements at new car prices. On the other hand more profit may have been made on the cars by taking advantage of lower cost financing. There was no way of knowing for sure at the time evaluations of alternatives were made.

Up to this point, reference has been made to market values during the period following satisfaction of initial financing. Recent events have increased interest in market values during the early years of equipment life.

The tendency to overreact to demands for products and services is typical of the business community. It is now evident that 50-foot boxcar and grain covered hopper car fleets have been overbuilt.

Attracted by tax benefits and prospects for long term demands, corporate and individual investors entered the market as lessors, bidding the market prices of new cars up at least 5% over what they would have been had only railroads and established private car lines been in the market. When demand precipitously evaporated, new car prices dropped approximately 12% rather than the typical 7% that the industry had been experiencing during previous low demand periods.

Market prices for secondhand boxcars younger than five years of age dropped along with the prices of new cars, but by greater percentages. In some instances available buyers were willing to pay prices that represented only 50% of prices paid by lessors near the end of the

peak demand period. Relatively few such transactions have been completed, however. Most lessors are attempting to maintain ownership, hoping for a return of demand.

While boxcar lessors were leasing to short line railroads on "per diem" or "utilization" leases with no guarantees, grain covered hopper lessors were leasing to shippers on five-year secure or operating lease contracts. Few relatively new secondhand covered hopper cars have been on the market. It is not possible now to predict market values when the initial leases expire. Most lessors will prefer to continue leasing in order to preserve all tax benefits. Should the leasing demand be weak and cars placed on the market for sale, market values will fall.

It is clear that the most difficult part of projecting after-tax, present value is deciding what future value to incorporate in the analysis. There is no question that such projections are imprecise. It is a matter of degree.

● **Looking ahead.** The task of making the analysis of the alternative forms of purchasing and leasing is increasingly difficult. Determining needs for the next five years is difficult; determining needs for the next 15 years is next to impossible. Business decisions resulting from deregulation will affect needs as will rail restructuring, energy costs, and interest rate levels.

From a major railroad's perspective certain car types always will be required. Financing those types will involve both purchasing and net payout leasing, depending on when and how many cars are

acquired. Since cash now is worth more than cash later, this analysis will be little affected by future residual values.

From a shipper's perspective the task is even more difficult than that of a railroad. Deregulation, line abandonments, changes in railroads' policies regarding introduction of private cars, obsolescence—all are factors relating to future needs. One favorable trend, however, is toward long term contracts involving customers, carriers, and shipper-furnished equipment. As with railroads, long term needs will lead shippers to purchasing, net payout leasing, and in some instances full service leasing. Again residual value assessment will be less important than profitability in the early years. For equipment not subject to long term contracts, full service and net operating leases will be selected. Lease terms of less than five years will be preferred, covering equipment already existing. Short term contracts covering new cars (prior to construction) will be very expensive due to lessors' assumptions of increasingly greater risks.

Operating leasing companies will choose between purchasing and net payout leasing as in the past. Again focus will be on relative profitability in the early years.

The future of the boxcar is more in doubt than ever before. The irony is that boxcars are more capital- and fuel-efficient in line-haul operations than piggy-back cars and trailers. The advantages are lost because of transit times and terminal costs.

Railroads always will have a major share of the coal-hauling market. As coal terminals incorporating ground storage facilities are developed, more unit trains of quick-dump cars will be required.

Covered hopper and tank cars probably are the safest investments in rail equipment. Except for those handling corrosive commodities, their useful lives tend to be longest because they receive the least abuse. They are least subject to obsolescence.

Each car type should be examined in the analysis of alternative methods of financing in light of potential obsolescence, trends in utilization, degree of expected abuse, and its future in the rail mode.

The analysis leading to the selection of one of the many alternatives within the purchasing and leasing options probably is one of the most difficult faced by most business managers. Assumptions pertaining to future events must be made. However, a thorough analysis involves making those assumptions. Good business managers seek and draw upon the best sources of experience in each of the disciplines related to rail equipment operations, management, and financing. The information is available if the manager is determined to find it. ■

About the authors

Walter H. Pogue, Jr., (MBA, Harvard, 1955; B.S.C.E., VPI, 1950), heads his own firm, Railroad Equipment Supply and Consulting Associates, Lancaster, Pa. His career has included stints as president of Berwick Forge & Fabricating, and general manager, Freight Car Division, General American Transportation Corp.

John H. Rubel (MBA, Chicago, 1971; B.A., Econ., Notre Dame, 1970), was vice president and controller, North American Car Corp., 1977-1978; he subsequently founded CAP-FORM, Inc., which was recently acquired by Emons Leasing, of which Mr. Rubel is now vice president-marketing.

Market

CARLOADINGS

Loadings of revenue freight in the week ended May 2 totaled 396,029 cars, according to the Association of American Railroads. This was a decrease of 61,915 cars, or 13.5%, compared with the corresponding week last year. Ton-miles generated by carloadings in the week ended May 2 are estimated at 16.6 billion, a decrease of 6.5% below the corresponding week of 1980.

REVENUE FREIGHT CARLOADINGS

Commodity	May 2 week
Grain	23,319
Farm products	3,968
Metallic ores	32,453
Coal	61,244
Crushed stone, gravel & sand	14,780
Nonmetallic minerals	14,967
Grain mill products	14,552
Food and kindred products	16,583
Primary forest products	19,455
Lumber and wood products (except furniture)	10,207
Pulp, paper and allied products	20,762
Chemicals and allied products	28,789
Petroleum products	5,003
Stone, clay and glass products	15,248
Coke	8,980
Metals & products	19,370
Motor vehicles & equipment	20,406
Waste & scrap materials	13,836
Forwarder & shipper assn. traffic	11,066
All other carloads	42,834
LCL traffic	207
Total cars loaded	396,029
Cumulative total	1981 1980
18 weeks	7,545,514 7,968,998
Estimated revenue ton-miles (billions), 18 weeks	315.9 319.7

PIGGYBACK LOADINGS

U.S. piggyback loadings for the week ended Apr. 25 totaled 31,461 cars (2.6% below the corresponding 1980 week) and 55,778 trailers or containers (down 5.9% from 1980). Cumulative volume for the first 17 weeks of 1981 is 542,441 cars (down 4.4% from 1980) and 983,114 trailers or containers (down 4.6% from 1980).

CANADIAN CARLOADINGS

Canadian railway revenue freight loaded in the seven-day period ended Apr. 14 totaled 4.9 million tons (down 1.1% from 1980). Cars loaded totaled 73,342 (up 0.2% from 1980). Cumulative loadings for 1981 were up to 71.3 million tons (up 0.9 from 1980).

● **American Electric Power Systems.**—Signed a long-term contract with PLM Railcar Maintenance Co. under which PLM will maintain 1,600 AEP open-top coal hoppers at its Alliance, Neb., shop. This brings to 4,300 the number of cars now maintained under contract at Alliance. PLM also maintains 1,600 AEP coal cars in the East.

● **Guatemala Railways.**—Ordered 10 2,000-hp diesel-electric units from Bombardier at a total cost of approximately \$14 million.

● **Southern Pacific.**—Placed an \$8-million order with ACF for 42 five-unit, articulated, double-stack container cars for delivery starting in July. Designed by SP and ACF, each of the new 270-ft cars can carry 10 containers (RA, Mar. 30, p. 35).

● **Toronto Transit Commission.**—Awarded a \$1-million contract to RMS Industrial Controls Inc. of Port Moody, B.C., for the supply of radio remote terminal units to be used in TTC's automated vehicle monitoring system.

● **Freight cars and locomotives.**—The following report has been received from the AAR and the ARCI.

DELIVERED

	March 1981	1980	February 1981	Three Months 1981	1980
Built new by carbuilders	4,718	8,224	4,401	14,183	22,870
Built new in RR shops	444	571	308	1,024	1,462
Built new—total	5,162	8,795	4,709	15,207	24,332
Rebuilt	136	222	150	321	426
TOTAL DELIVERED	5,298	9,017	4,859	15,528	24,758
Locomotives (new and rebuilt)	92	246	67	188	539

ORDERED

	1981	1980	1981	1980
To be built new by carbuilders	1,559	3,471	2,069	5,865
To be built new in RR shops	0	0	0	0
To be built new—total	1,559	3,471	2,069	5,865
To be rebuilt	300	68	0	600
TOTAL ORDERED	1,859	3,539	2,069	6,465

ON ORDER AND UNDELIVERED

	April 1 1981	1980	March 1 1981	Average backlog 1981	1980
To be built new by carbuilders	38,059	96,165	41,197	41,158	103,328
To be built new in RR shops	3,480	4,790	3,924	3,879	5,325
To be built new—total	41,539	100,955	45,121	45,037	108,653
To be rebuilt	279	507	115	220	642
TOTAL ON ORDER	41,818	101,462	45,236	45,257	109,295
Locomotives (new and rebuilt)	411	1,114	471	468	1,230

